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ABSTRACT

Described here are methods being worked out, inductively, to convert to quantifiable factors a set of 144 personal interaction variables observed during individual testing of a multi-cultural sample of 50 high school students referred for school problems. Factor analyses of subsets of variables and comparison of correlations among "factor scores" have been most effective. Observations were for the Wechsler Intelligence Scale for Children (WISC); a parallel study for the Wechsler Adult Intelligence Scale (WAIS) is in process. The goal is a checklist for extraneous interactions for use in studies of culturally based factors which interfere with students' functioning when they are tested or when they are aroused by tutorial or evaluative figures, generally, and thereby lead to "false positives" in the assessment of disabilities. Tentative conclusions are: (1) that the same observed behavior, e.g., "smiles," may signal different things on different subtests; (2) that both subtest-specific and more general cross-subtest factors can be identified; (3) that related sets of factors, or syndromes which seem to function as macroprocesses, can be recognized; and (4) that style factors consisting of positively and negatively loaded variables were significantly related to ethnicity, but not to other demographic variables in the sample. (Author/CM)

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ED228291

ASSESSING SOCIAL-INTERACTION FACTORS IN TEST-TAKING BEHAVIOR

Methods being used to develop a checklist
from observation of high school students during testing.

Prepared for the 1983 Annual Meeting
of the American Educational Research Association
in Montreal, Canada

by

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ABSTRACT

Described here are methods being worked out, inductively, to convert, to quantifiable factors, a set of 144 personal interaction variables observed during individual testing of a multi-cultural sample of 50 high school students referred for school problems. Factor analyses of subsets of variables and comparison of correlations among "factor scores", have been the most effective. Observations were for the WISC; a parallel study for the WAIS is in process. The goal is a checklist for extraneous interactions for use in studies of culturally-based factors which a) interfere with students' functioning on tests or when they are aroused by tutorial or evaluative figures, generally, and which b) thereby lead to "false positives" in the assessment of disabilities.

Tentative conclusions are: 1) that the same observed behavior, e.g., "Smiles," may signal different things on different subtests; 2) that both subtest-specific and more general cross-subtest factors can be identified, 3) that related sets of factors, or syndromes which seem to function as macroprocesses, can be recognized, and 4) that style factors consisting of positively and negatively loaded variables were significantly related to ethnicity, but not to other demographic variables, in our sample.

INTRODUCTION

This paper describes a step in development of a "Skill Inventory" check list for analyzing performance on individual tests. Studies of SAT scores, made by us around 1970, indicated that a student's verbal/quantitative profile could be predicted with reasonable accuracy by an interacting set of demographic factors, the effects of which cumulate (Belz 1971). From this discovery, it seemed more appropriate to think of aptitude test scores as indicators of the presence of specific cultural role-relationships in an individual's developmental "learning space" (i.e., family milieu) than as measures of such constructs as "intelligence," even though the effect appeared to be on cognitive skills. In the hundreds of case studies we have done since then, it also appeared that test profiles changed over time in ways that milieu factors would predict. Thus, a search for culturally unbiased tests and "true" levels of internal traits seemed bound to fail, while it appeared that the search should, instead, be for techniques to assess cultural transmission and the effects of particular learning space configurations. This kind of information turns out to be far more relevant to educational practice than trait measures because it reveals the type of milieu in which particular patterns of cognitive development take place, and in which remediation of deficits should take place if we knew how to use this information.

In pursuit of such information in our large multi-cultural high school district, we have made successive refinements of test response inventories which enable the psychologist to look carefully at both right and wrong responses, taken down verbatim, and accompanied by observations of behavior and personal interactions. Such check lists are generated initially by cataloguing responses from sets of one hundred protocols from current referrals. They are refined by dropping out items of low frequency in later samples. An essential premise, consistently applied, has been that, in an adolescent population, at least, <u>all</u> responses are evidences of "skills" rather than "deficits" or "emotional problems."

That is, the students' responses reflect those ways of coping with a test situation that, learned over time, serve the student best. We have observed that these kinds of responses are also evoked when the student is under achievement pressure in classrooms. Looked at in the context of information about the students' background learning spaces and developmental histories, their mental and social skill profiles often reveal that students who might otherwise be labeled defective or 'handicapped', are in fact dealing with school challenges in ways that reflect intelligent adaptations in those milieus in which they were destined to be born and grow, though these profiles are counter-productive in school. Clinically, this model has led to effective diagnosis of school problems in many of the carefully analyzed cases in our accumulating files.

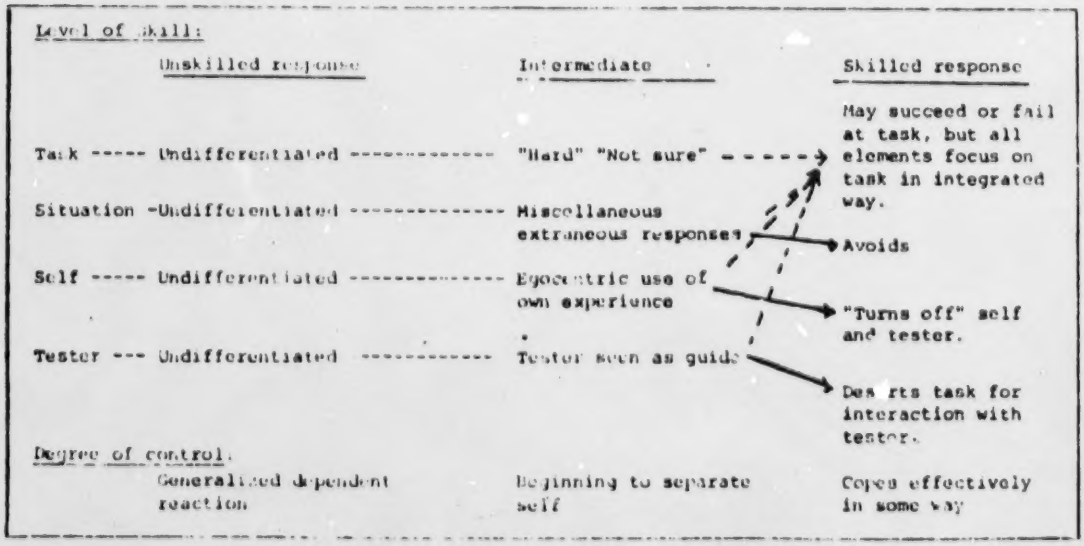
However, validation of such observations first requires us to convert our catalogue of responses from qualitative comments to quantifiable factors which can be scored reliably by various observers. Though our skill inventory also includes problem-solving and information processing variables, and a similar check list has been made for the Stanford Binet, this paper describes only the social interaction component as observed in giving the Wechsler Intelligence Scale for Children (WISC).

HYPOTHESES

Some 148 variables resulted when the large number of individual responses originally included in the social interaction catalogue were reduced by empirical reasoning. It was then predicted that there would emerge from these: a) specific subtest factors, b) general factors that would cross subtests and c) style factors that would interact positively and negatively with different types of subtests.

An overall model for analyzing the dynamics of the response process, i.e., the ways in which responses are applied in personal relationships, was also derived empirically. It suggests that there is a continuum with "global" dependence at one end, and at the other end, more specific skills for avoiding questions, extracting help, distracting the tester, responding appropriately, monitoring and encouraging self, and the like. So, in the scoring manual, those variables presumed to be "global" were given low numbers, while high numbered variables were those felt to reflect more expert focusing on a) the test item, b) the tester, c) the situation and d) the student's self. This arrangement will permit tests of the hypothesis that social interactions observed in adolescents are skilled responses. A diagram of this model is shown in Figure I.

Figure 1. A model for classifying personal interactions in testing.


Level of skill:
Unskilled response
Intermediate
Skilled response
Task ----- Undifferentiated ----------
"Hard" "Not sure"
May succeed or fail at task, but all elements focus on task in integrated way.
Situation -Undifferentiated ----------
Miscellaneous extraneous responses
Avoids
Self ----- Undifferentiated ----------
Egocentric use of own experience
"Turns off" self and tester.
Tester --- Undifferentiated ----------
Tester seen as guide
Deserts task for interaction with tester.
Degree of control:
Generalized dependent reaction
Beginning to separate self
Copes effectively in some way

An alternative to the dependency-control continuum hypothesis was derived from our case study follow-up with parents. We have been impressed by the extent to which social interaction patterns seem to have been incorporated by imitation of parents, and then are reproduced, often out of context, when their children are faced with challenges of one sort or another. E.g., the child's way of interacting may signal a feeling which the child will deny, if asked, and the same mannerism will then be observed in the parent. These observations suggest that, rather than progressing from "global" responses to more purposeful ones, we will find internally consistent response syndromes, all parts of which do not seem equally mature or logical, but which are triggered in full, as macro-processes reflecting experience in problem-solving situations.

More specific hypotheses must await definitions of the social interaction factors to which this paper is addressed. It is assumed that a) future studies will show that some of these factors relate to the phenomenon of "learned helplessness" (Dweck , 1976 ; Garber and Seligman, 1980); and that b) other identifiable syndromes, made up of correlated social interaction factors, and related to specific learning space configurations and cognitive profiles, will be found. However, it should be emphasized again that our present goal is to develop an instrument through which such characteristics of the learner can be studied. In the absence of a more appropriate design, any findings from the present work are no more than leads in a pilot study.

METHOD

Identification of Subtest Factors:

The aforementioned scoring manual for 148 variables was applied to 50 WAIS and 50 WISC protocols obtained by two women psychologists, as they came in from students referred in 1981 and 1982 for school problems. Differences in the resulting patterns of social interaction variables for the WISC and WAIS required separate studies of each one. The current paper deals only with the WISC. It has eleven subtests to which we added two others that we use routinely. These were a written Sentence Completion test and a "Reading" test which involves oral reading of the Vocabulary subtest word list in order to check word recognition as compared to semantic understanding of the same words. Though the WISC-R has been published since work on our check-list began, and the variables we have identified seem to apply, we have not yet included this test because it appears to give less cultural information.

Infrequent responses had been dropped or consolidated as far as possible in making up the scoring manual; but in applying it to our sample of protocols we found some variables with a total N of less than five; and also, some responses scattered so widely over various subtests that, although the total N was five or more, no individual subtest N reached five. The presence of these variables seemed to account for the fact that the first attempt at analysis yielded only singular results; no factors were identified for any subtest on this analysis.

When all variables having less than five occurrences on a given subtest were removed from that subtest cluster, a total of 72 social interaction factors emerged for the WISC, and 84 for the WAIS. The Coding subtest was dropped as there were no variables with N of five or more. The distribution of variables and factors, by subtest, is found in Table 1 on page 13.

Identification of General Factors:

To determine which factors crossed two or more subtests, several strategies were used. First, it was assumed that those variables with the most signifi-

cant within-subtest correlations reflected strong behavior patterns that would carry over to other subtests. Consequently, for each subtest, "main" variables which displayed correlations of .23 or more with at least 47 percent of that subtest's variables were identified; and matrices of the correlates were set up. However, Table 2 shows that out of 28 main variables, only eight carried over to a second subtest, and only one ("Don't know...don't know what it means") was a "main" variable on more than two subtests.

Even more discouraging, when matrices of correlates were compared for re-occurring sets of significantly related variables, even as small as a pair, so little consistency was found that this approach was abandoned. It was concluded that a) if a response did carry across subtests, it was apt to take on different forms, or b), that the same observed interaction response could mean something different on different subtests.

The second approach was to compute "factor scores" for each student by adding up that student's scores on all variables upon which a given factor loaded. A Pearson correlation study across subtests was then done to look at relationships among all 72 WISC subtest factors. At the level of $P = .05$, with an expectancy of 128 coefficients significant by chance, 302 (12%) were statistically significant. Only 11 reached the .001 probability level (see Table 3), leading to the conclusion that correlations between factors were too tenuous for us to say that cross-subtest factors had been identified. Further examination of the individual variables that made up significantly correlated factors also showed remarkably little communality. Again, it appeared that some responses must change form, depending on the subtest, while others that looked the same meant something different on different subtests.

A third strategy was then devised as follows: Single-variable (SV) factors, 13 in number, had been found. These factors had the advantage that they were scattered across most subtests, and the behavior which each factor represented was clear. In order to find variables on other subtests that actually represented

the same response factor as the SV factor, we then made up clusters which included all variables in all factors that were significantly correlated with each of the SV factors. A residual cluster was also formed from those factors which had not turned up in any of the 13 SV clusters.

Table 4 shows the number of factors found in these 14 clusters. It also shows that, across subtests, all the SV factors picked up additional variables to become more general; none remained single. On the other hand, within these new clusters, now built around SV factors rather than subtest tasks, some of the multi-variable factors did remain intact and subtest-specific, picking up no new variables from other subtests. Still other factors remained intact, but added variables from other subtests, and some broke up and recombined to form new, cross-subtest factors.

Syndromes:

To examine the possibility that the same student response set may take different forms on different subtests, correlates of the subtest-specific factors that had remained intact within the SV clusters were reviewed. Not only had these factors retained the configurations originally found in subtest analyses, but several of them also remained entirely discrete in that none of their variables re-occurred in factors correlated with them. It thus appeared that each of these factors, with its correlates, reflects a syndrome of related responses that can be predicted, one from the other, across subtests. If so, the method for identifying syndromes involves screening clusters of variables for subtest-specific factors and then identifying their correlates. This has been done for the subtest-specific factors for Information, Comprehension, and Block Design subtests. The Information factors and their correlates are shown in Table 10. Some of the correlates are positive and others negative, seeming to indicate that a syndrome may include stylistic factors which would result in interactions with various types of treatments.

Multi-factor variables:

To verify the existence of multi-factor variables, i.e., variables that look the same, but seem to mean something different on different subtests, all variables associated with a suspected multi-factor variable, e.g., Variable 30 (Smiled/laughed), were set up. The resulting cluster was analyzed to find those factors that load on the variable in question. Three "Smile/laugh" factors emerged as shown in Table 14.

The methodological implication of the syndrome and multi-factor analyses is that the original designation of 148 variables, as set forth in the manual, is insufficient. Variables need, instead, to be designated by number and subtest of occurrence, e.g., Inf/40. In effect, this multiplies the number of variables to the point where an overall analysis for cross-subtest factors is not feasible, and sub-sets of variables must be used instead. To facilitate this process, "gradients" were set up as shown in Figures 2, 3 and 4. The first one shows the total distribution of each variable across all subtests, with the largest N as the "center." The second gradient shows all significant factor loadings for each variable, with the largest again as the "center." In both of these gradients, "verbal" subtests are to the left and "performance" subtests to the right. The third gradient shows the correlates of each subtest factor, using the same format.

The Dependency-Control (Lo/Hi) Continuum:

The method for assessing the dynamics of the social interaction response process, according to a "dependency-to-control" continuum, involves correlational studies of low-numbered (Low#) and high-numbered (High#) variables, analysis of Low# and High# clusters of variables, and studies of the relationship between Low# and High# factors and background variables. Thus, after setting three very widely distributed variables with large N's aside (Var. 30, 62, 64), two clusters were made up of all remaining variables from subtest factors which contained only low- or high-numbered variables, and these two clusters were analyzed for cross-subtest factors. A third cluster was made up for all variables in factors which had both

Figure 2. Gradient of Subtest N's

N's for WISC Variables
(N ≥ 5)

#	Title	CV																Ttl
4	Referred to self as "i"											6 SC						6
5	Referred to "you"						3 IN	20 SM	27 SC	43 CO	44 VO							137
6	Referred to "we/us/our"										13 SC							13
7	Referred to "him/her/he/she/his/hers"									4 VO	21 SC							25
8	Referred to "them/they/theirs/every-any-some-body/one/others"							2 VC	2 CO	38 SC								42
9	Echoed clichés: parents' assist, patriotic, religious									8 SC								8
13	Lets tester guide responses									2 RD	3 VO	1 FA						6
14	Performed from tester's standpoint										4 PA BD	2 OA	2 CD					12
15	Shook head "no"					2 DS	2 AR	3 SM	5 IN	10 CO VO	3 FC	1 ED						36
16	Used hands to point or gesture							2 IN	3 CO	5 VO	3 FC							13
17	Trailed off assuming "you" would have some thoughts & finish idea					2 CO	2 IN	6 SM	7 VO	10 SC	3 FC							30
19	Made hand or leg movement									1 CO SM AR DS CD								5
23	Did something to self without object (scratched)							1 DS	1 SM	2 VO	1 OA							5

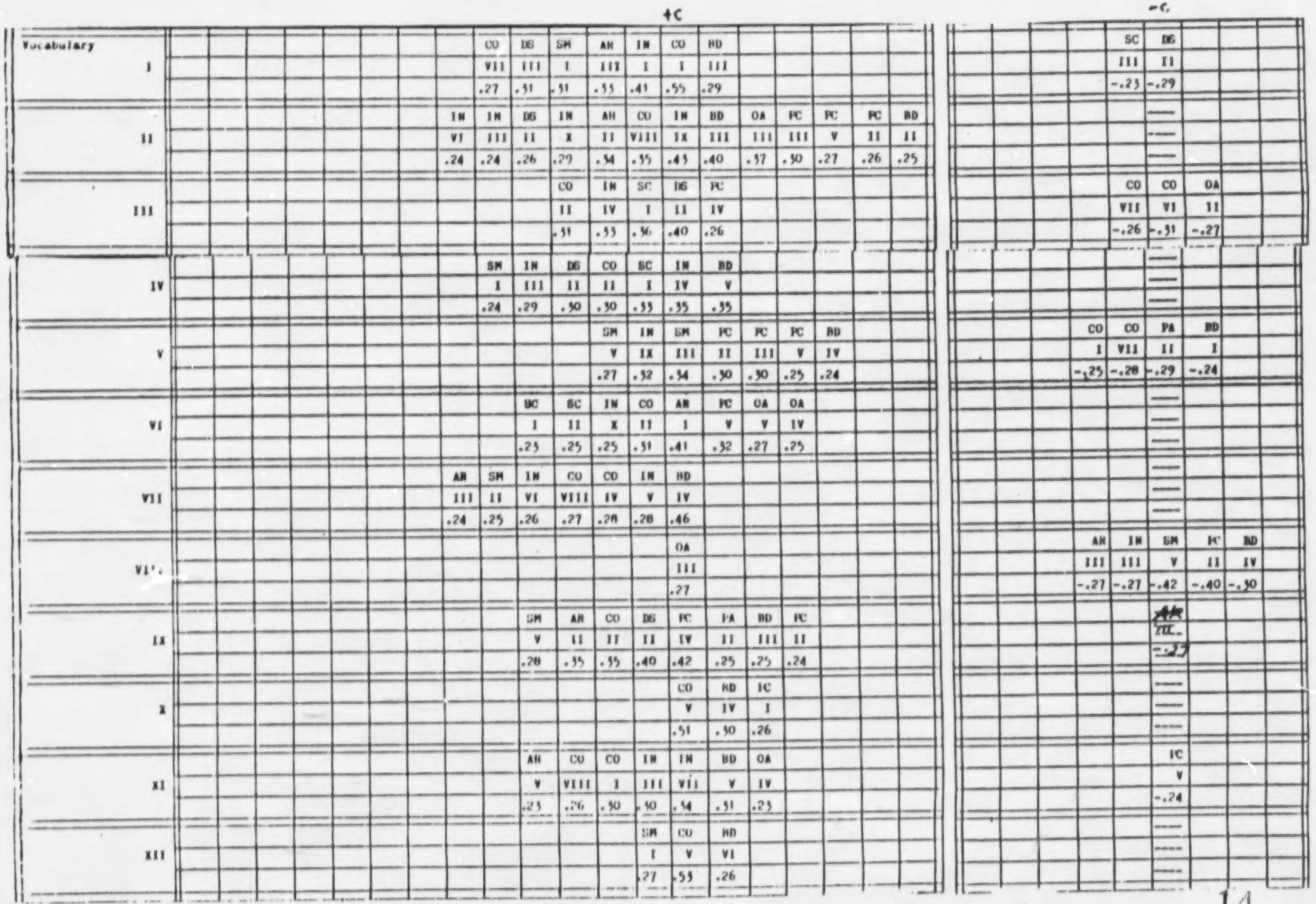
Continued-

Figure 3. Gradient of variable loadings in Subtest Factors

Var#	Title	+CV									-CV		
t2	Tester intervened			SC 1	VC 3	CC 8	BD 1	PA 1	OA 3			IN 1	SM 2
				.34	.51	.56	.93	.84	.58			-.39	-.84
				12	45	48	15	21	6			45	25
t3	Tester intervened on beginning items						IN 4						—
							.30						—
							6						—
t4	Student responded to intervention	RD 2	VC 8	SM 3	CC 8	IN 2	PA 1	BD 1					—
		.21	.47	.57	.70	.79	.98	.84					—
		20	41	17	40	17	9	14					—
t5	Referred to "I/me/my opinion/to me/for me"						SC 1						CC 6
							.55						-.38
							42						25
t7	Referred to personal experience						CC 1						—
							.75						—
							11						—
t8	Referred to family						VC 12						CC 8
							.44						-.43
							9						4

Continued-

Figure 4. Gradient of correlates of each Subtest Factor, by Subtest



high- and low-numbered variables in them, and it too was analyzed.

Factor scores for each of the new factors found in the Low# and High# clusters were then obtained for each student, as before, and a matrix for these two sets of scores was obtained in order to look at the extent to which they were intercorrelated. Only those factors in which all variables carried positive loads were used. A factor analysis of these scores was then done. It was found that the majority of the factors merged, drawing together Low# and High# elements. This result gave too little support for the Continuum Hypothesis to warrant further classification of High# variables in terms that the model suggests.

However, as a further check, Chi square statistics were obtained to assess the relationship between single demographic factors and Low# and High# factor scores, summed to obtain a total score for each cluster of factors. We would have preferred to assess results in terms of students' total "learning spaces" (Belz, 1971, 1974, 1980), defined as interacting sets of four variables: sex, ordinal place, ethnic background and father's occupation. But in this sample of only 50 cases, only four of the spaces formed by this model had more than one occupant (see Appendix), so only single variables were used.

Style Factors:

In this work, negative statistics require special study. Four kinds can be described: First, there are pairs of positively and negatively correlated variables which seem to reflect habitual styles. Second, there are positively and negatively loaded variables within some factors. Both these kinds of pairs give information about what a student who scores high on one, does not do on the other; thus more definition of the behavior is provided than otherwise. Third, when factor scores are compared, some whole factors are negatively related to others. Such outcomes seem to be defining subtest interactions within a set of related factors. Finally, those factors that contain only negatively

loaded variables seem only to be defining the parameters of the cluster in which they occur. As they are apt to turn positive in another cluster, they give little general information. Only the first three are considered to be "style" elements in this work.

To look at styles, clusters of Low# and High# factors with both positively and negatively loaded variables in them were set up as before, except that net scores were used. That is, the scores for negatively loaded variables were subtracted from positive ones within each factor. To eliminate negative numbers, the resulting scale was reset so that the largest negative score, -2, became "1", etc. Net zero scores became "3" and true zeroes were maintained. None of these studies supported the Continuum Hypothesis, so it has been set aside, while work on the identification of subtest-specific factors and syndromes continues.

In all, 108 of the 144 variables identified in the scoring manual had total N's of five or more. But for 31 of these, N did not reach five on any WISC subtests, leaving 77 variables to be studied by means of various sub-sets or clusters. No variables with N equal to five or more were found for the Coding subtest.

SUBTEST FACTORS:

When all 144 variables were factor-analyzed for the Reading, Sentence Completion and WISC subtests, only singular matrices resulted. After removal of the subtest variables with N less than five, and the Coding subtest, the number of variables to be analyzed in each cluster ranged from 29 for Information and Vocabulary, to five on Reading. Factor analyses of these clusters produced a total of 72 subtest factors, ranging from two on the Reading subtests to 12 on Vocabulary. Five residual variables played no significant part in any cluster; and there were also a few residuals within most of the individual clusters.

Because it was shown by later analyses that the same observed behavior seemed to mean different things on different subtests, at times, the variables were redefined in terms of number and subtest (e.g., Inf/40), giving a working total of 172. The distribution of subtest factors and variables is shown in Table 1.

Table 1 WISC: Distribution of variables with subtest N≥5, and number of factors obtained from analyses of subtest clusters

Subtest	IN	CO	SM	AR	VO	DS	PA	PC	OA	BD	CD	SC	RD	TOTAL
Number of variables in subtest cluster	29	19	13	12	30	7	9	15	11	14	Ø	9	5	173
Number of factors obtained	11	7	5	5	12	3	4	6	5	7	Ø	4	2	71
Number of Residual Variables*	1	2	1	Ø	2	1	2	2	Ø	4	Ø	1	1	17

* 3 of these do not have significant loadings in any subtest

Table 2 shows the variables that split insignificantly among the factors in the subtests shown. Table 3 shows the residuals that did not occur in any

subtest factor. These variables require further study.

Table 2. Variables which occur with frequency ≥5 on a given subtest, but have no significant factor loadings within the subtest cluster

Subtest/Var#	Subtest N	Title
CO/5	43	Referred to "you"
SC/17	10*	Trailed off, assuming "you" would have some thoughts and finish idea
VO/28	11*	Used fillers ("um/uh/well/etc")
PC/43	6	Left open-ended ("whatever")
VO/75	16*	Excused self—lack of academic exposure
PA/126	11	Obviously hurried; used two hands rapidly
PC/138	14	Assembled in a perfunctory way/superficial guessing
DS/138	7	Assembled in a perfunctory way/superficial guessing
CO/142	8	Argued/disagreed with/suspicious of test/items
RD/158	9*	Asked tester to: confirm instructions/directions
BD/158	8	Asked tester to: confirm instructions/directions
BD/164	7	Asked tester to: help/narrow alternatives
BD/168	11*	Asked tester to: frame/structure the test/items

* Largest N of any subtest

Table 3. Residuals in no subtest factor

Variable #	Largest Subtest N	Total N	Title
28	VO/11	14	Used fillers ("um/uh/well/etc")
50	IN/7	13	"Not (quite) sure/don't know"
125	PA/6	14	Commented on being timed/time/own speed
163	SM/5	8	Asked tester to: define words
172	BD/5	17	Hinted at/resisted/challenged with questions

Table 4, on the next page, shows the distribution of "Main" variables, identified as those significantly related to 47 percent or more of the remaining variables in the subtest cluster. When matrices for these main variables and their

correlates were compared, it was found that no subsets of intercorrelated variables, even as small as pairs, crossed consistently to other subtest matrices. Thus, no general personal interaction factors could be isolated for either the WISC or the WAIS in this way. The main variables that occur on several subtests are also destined for further study.

Table 4. "Main" subtest variables. Numerals show the subtest factor into which the "main" variable fell.

Var #	Ttl N	Title	Subtest										
			IN	CO	SM	AR	VO	DS	PA	PC	OA	BD	SC	RD
7	25	Referred to "him/her/he/she/his/hers"											III	
8	42	"Thez/they/theirs/every-any-some-body/ one"											II	
17	30	Trailed off assuming "you" would finish			III									
26	50	Verbalized steps/solved probs. outloud									II	II		
30	68	Smiled/laughed	IX	III										
42	62	Ended with "...or something/stuff/ things like that"					II							
44	88	Repeated items/directions/words in questioning tone	XI		I									
45	109	Responded in questioning tone	IX			II								
46	36	"I think/suppose/believe"	X											
47	67	"I guess"		II										
49	74	Said "don't know how/can't do it" but continued		VI	III									
61	30	Heard wrong information/continued incorrectly								I				
62	229	Tester intervened			II									
66	75	Referred to "I/me/my opinion/to me/ for me"		VI									I	
67	16	Referred to personal experience		I										
105	169	"Don't know...what it means"		IV		I				IV				I
111	25	"Can't/don't remember (how)"/"forgot/ lost it"	VII											
119	24	Recalled from previous testing									I			
121	15	Commented on/talked to materials as though alive									II			
127	15	Continued past time/checked work										VI		
130	63	Corrected self; "double-take"									V			
132	27	"At least will try"/"trying best"								I				
136	28	Expressed mastery/ease					IV					V		
140	20	Was surprised on beginning items	VIII											
149	10	Handled materials by self										IV		
159	46	Asked tester to: confirm answers										IV		
160	91	Asked tester to: repeat directions/ items/words	XI	II										
164	52	Asked tester to: help/narrow alternatives									I			

CORRELATIONS AMONG SUBTEST FACTOR SCORES:

Students' scores on the 72 factors* produced 302 significant correlation coefficients at the level of $P < .05$ (12%), of which 128 could have been significant by chance. Those at the level of $P \leq .001$ are shown in Table 5.

Table 5. Factor score correlations $P \leq .001$

Within Subtests			Across Subtests						
Subtest	Factors	r		CO	AR	PA	OA	BD	SC	RD
IN	III/XI	.51	VO	.51 .53 .55				.46		
CO	I/VII	.54								
VO	II/V	.55	CO		.52				.66	
			SM		.59			.50		.44
			AR			.52				
			PC				.48			

SINGLE-VARIABLE (SV) CLUSTERS:

Thirteen single-variable (SV) factors emerged from the subtest clusters, as shown in Table 6. When all variables in factors correlated with these SV factors were assembled, the resulting clusters ranged from five variables for Inf/75, to 43 variables for DS/45, which was at the statistical limit for 50 cases. Since there were only 77 original variables to draw from, these numbers included from 11 to 60 percent of the total. However, of note was the finding that only five of the 13 variables in the SV factors, themselves, re-occurred in factors that were correlated with them.

Nor was there a great deal of overlap between the SV clusters. Variables from the Inf/64 cluster appeared 9 times in other clusters, and those in the DS/45 cluster appeared 10 times, but the overall average was only 4.3 outside occurrences, per cluster. Thus, it appeared that, by this method, fairly

*A factor score was the sum of the student's scores on all variables in a given factor, without regard to positive or negative loading.

discrete clusters, which reflected the overall structure of the test in some way, had been identified in all but three instances (Inf/64, Inf/75, DS/45). On the other hand, there were no SV factors for Reading or Comprehension to draw clusters around. Also, some 35 (20%) of the 172 subtest factor variables were not included in any cluster. These were picked up in a residual cluster, from which 14 factors were obtained.

When the SV clusters were analyzed, all the SV factors, themselves, re-occurred in expanded form to include variables from one or more other subtests. The loadings for the SV variables in these expanded factors are shown in Table 6, and also the percent of variance within the SV cluster which that factor explains. It can be seen that, with loads of around .50, or less, four of the 13 SV variables were of minor significance within their own clusters, while others appeared with large loadings on the first factors extracted.

Table 6 Relation of Single-Variable (SV) Factors to their own correlated Factor Clusters and other SV Clusters

Subtest SV Factor	IN II	IN V	SM IV	AR V	VO VII	VO IX	DS II	PA III	PC VI	OA IV	BD VI	BD VII	SC IV
Single Variable #	64	75	30	27	16	44	45	26	142	171	127	126	4
Re-occurrence of SV Factor Variable in correlated subtest factors	PA	none	CO IN	none	none	AR	IN	OA	none	none	none	none	none
Number of variables in SV Cluster	22	5	14	23	16	21	43	18	13	23	26	14	33
Number of factors obtained from SV Cluster	9	2	5	9	6	8	15	8	6	9	9	5	11
SV Cluster Factor on which SV occurs with loading of $\geq$.40	II	II	I	IV	I	II	IX	I	II	I	VI	V	III
Loading of SV for that factor	.67	.48	.75	.47	.75	.43	.47	.78	.62	.72	.71	.70	.53
% of SV Cluster Variance explained by that factor	16%	36%	37%	12%	32%	19%	5%	30%	24%	19%	7%	8%	12%
Number of times any SV Cluster Variables re-occurred in other SV Clusters ($\geq$.40)	9	1	6	6	1	5	10	4	3	6	Ø	4	1
% of cluster overlap	41%	20%	43%	26%	6%	24%	67%	22%	23%	26%	Ø	29%	3%

The expanded factors are shown in detail in Table 7. Titles of the variables are also shown.

Table 7 Expansion of Single-Variable Subtest Factors within SV clusters: new Factor having the largest loading on Single Variable

Single Variable Factor from Subtest Cluster		Variable	Loading	Title
IN/II	Var 64	IN/64	.67	Student responded to intervention
		SM/160	.42	Asked tester to: repeat directions/items/words
		PA/118	-.40	Pushed material toward/to face tester when done
IN/V	Var 75	IN/75	.48	Excused self—lack of academic exposure
		PC/142	.41	Argued/disagreed with/suspicious of test/items
		VO/16	-.40	Used hands to point or gesture
SM/IV	Var 30	SM/30	.75	Smiled/laughed
		DS/51	.79	Exclaimed
AR/V	Var 27	AR/27	.47	Repeated items/directions/words/numbers
		VO/114	.67	"Don't know how to/can't really explain/express"
		VO/47	.63	"I guess"
		VO/51	.43	Exclaimed
VO/VII	Var 16	VO/16	.75	Used hands to point or gesture
		AR/38	.67	Left unspecific/rounded off
		AR/126	.64	Obviously hurried; used two hands rapidly
VO/IX	Var 44	VO/44	.43	Repeated items/directions/words in questioning tone
		PC/158	.71	Asked tester to: confirm instructions/directions
		SM/45	.65	Responded in questioning tone
		DS/45	.53	Responded in questioning tone
DS/II	Var 45	DS/45	.47	Responded in questioning tone
		VO/44	.78	Repeated items/directions/words in questioning tone
		AR/45	.49	Responded in questioning tone
		PC/158	.47	Asked tester to: confirm instructions/directions
		PC/165	.42	Asked tester to: give answers/answer question of own
PA/III	Var 26	PA/26	.78	Verbalized steps/solved problems outloud
		PC/165	.72	Asked tester to: give answers/answer question of own
PC/VI	Var 142	PC/142	.62	Argued/disagreed with/suspicious of test/items
		SC/8	.76	"Them/they/theirs/every-any-some-body/one/others"
OA/IV	Var 171	OA/171	.72	Generally interactive
		VO/114	.74	"Don't know how to/can't really explain/express"
		VO/47	.42	"I guess"
BD/VI	Var 127	BD/127	.71	Continued past time/checked work
		IN/74	.52	Excused self—lack of experience
		VO/49	-.43	Said "don't know how/can't do it" but continued
BD/VII	Var 126	BD/126	.70	Obviously hurried; used two hands rapidly
		IN/111	-.42	"Can't/don't remember (how)"/"forgot/lost it"
SC/IV	Var 4	SC/4	.53	Referred to self as "I"
		IN/27	.71	Repeated items/directions/words/numbers
		IN/164	.61	Asked tester to: help/narrow alternatives
		BD/159	.54	Asked tester to: confirm answers
		CO/128	.42	Added facts/ideas/alternatives/qualifications

Only one of the SV clusters, that of BD VII/126 ("Obviously hurried, used two hands rapidly"), seemed consistent enough to suggest a syndrome. It was made up of four subtest factors whose correlation with BD VII/126 ranged from -.29 to +.26. BD/126 itself did not reoccur in any of its correlated factors. The makeup of BD VII/126 is shown in Table 8.

Table 8 Single-Variable Cluster X: BD VII/126 "Obviously hurried; used two hands rapidly"

Subtest Factor	Correlation with SV BD/126	Variable #	Subtest N	% of Total N	Factor Loading
SC/IV	.24	SC/4	6*	100%	.77
IN/I	.26	IN/71	5*	83%	.78
		IN/159	8*	17%	.75
		IN/34	13*	37%	.67
		IN/112	5*	56%	.51
		IN/31	7*	47%	.48
		IN/62	45	20%	-.39
SM/III	-.29	SM/64	17	10%	.57
		SM/49**	10	14%	.50
		SM/17	6	20%	.33
IN/VII	-.22	IN/49**	11	15%	.66
		IN/42	8	13%	-.56
		IN/111	13*	52%	.44

* Largest N of any subtest
** Var. 49 occurs twice, but r SM 49/IN 49 is not significant

Table 9 shows the factors that were then extracted from this cluster. Three new cross-subtest factors emerged. Variable SM/49 split evenly between two factors, and it was unrelated to variable Inf/49 (r = 0), suggesting that 49 is a multi-factor variable. The remaining variables appear, each in their own way, to indicate dependency on the tester to think for the student and a general lack of confidence in his or her own thoughts. The fact that most variables in this cluster are low numbered (below 78) lends some support to the hypothesis that there is a dependency-control continuum to be considered.

Table 9 Factors from SV Cluster X, BD/126

Factor #	% of Cluster Variance	Positively Loaded Variables: Variable #	Loading	Title	Negatively Loaded Variables: Variable #	Loading	Title
I	39%	IN/159	.90	Asked tester to: confirm answers; "would you say/this what you mean/ you want me to be more specific?"	IN/62	-.40	Tester intervened; needed repetition/questioned/ questioned at least once in 5 items/had to be urged to guess (IN)
		IN/71	.63	Referred to having had/learned/ studied/read in class; learning/ reading source/"kids know"			
		IN/34	.49	Changed response (order)/gave two answers/contradicted self/made false starts			
		SM/49	.42	Said "don't know how/can't do it.." but continued; responded but also said "don't know/no/no idea/can't tell/forgot" (no ideas were added when questioned)			
II	24%	IN/112	.64	Indicated inability to recall something familiar			
		CC/4	.55	Referred to self as "i"			
		IN/34	.45	Changed response (order)/gave two answers/contradicted self/made false starts			
		IN/71	.44	Referred to having had/learned/ studied/read in class; learning/ reading source/"kids know"			
III	17%	SM/64	.69	Student responded to intervention; expanded/improved (SM)			
		SM/17	.51	Trailed off, assuming "you" would have some thoughts and finish idea			
		SM/49	.41	Said "don't know how/can't do it.." but continued; responded but also said "don't know/no/no idea/can't tell/forgot" (no ideas were added when questioned)			
IV	13%	IN/49	.46	Said "don't know how/can't do it.." but continued; responded but also said "don't know/no/no idea/can't tell/forgot" (no ideas were added when questioned)	IN/42	-.70	Ended with "...or something/stuff/things like that"; "like/and...all that/what stuff...everything/so on"
V	8%	BD/126	.70	Obviously hurried; used two hands rapidly	IN/111	-.42	"Can't/don't remember (how)," "forgot/lost it"
Residual		IN/31 Factor I	.39	Joked/playful testing of limits; joked/playful testing on beginning items/when stuck	SM/17 Factor V	-.35	Trailed off, assuming "you" would have some thoughts and finish idea

CONSISTENCY OF VARIABLES ACROSS SUBTESTS:

Like Variable 49 in the BD VII/126 cluster, several other variables appeared in factors from two or more subtests within the same cluster. Correlation coefficients for such re-occurrences in all 13 SV clusters and the residual cluster are shown for Vocabulary, Sentence Completions, and Reading, as examples, in Table 10.

Table 10 Correlation Coefficients (.23+) for "Repeating Variables" which occur on more than one subtest

		VO	SC	RD	IN	SM	CO	DS	PA	OA	PC	BD	AR
Vocabulary	5					●		.32					
	15				●			●					
	16				●								
	17					●							
	25							●					
	26										●		
	27							●					
	30				●	●	.44	●		●	●		
	34							●					
	38												.43
	42							●					
	43				●								
	44						.24	.35					●
	45			●	●	.26		.32			.23		.36
	46				.25			●					
	47				●	●	●			.33			●
	49					●	●	●			.48	.23	
	51							●		.33		●	●
	54											●	
	56											.26	
	62				●	●	●	.31					
	64				.24		●						
	69						●					●	
	73				●				●				
	74		●		●								
	75				●								
	105				●		●	.28			●		
	109							●					
	114									.44			.44
	118										●		
	126												.59
	136							●			●		
	142					●							
	149											.23	
	154												.34
	155				●			●					
	158							-.23			.31		
	159							●			●	●	
	160				●		●			●			●
	164						●	.30					
	165										.54		
	171								●	●			
Sentence Completion	4											●	
	5					●							
	6										●		
	8										.36		
	27				.38								
	31				●								
	34				.27								
	40				●								
	41				.24								
	43				.34								
	44				●								
	46				●								
	47						.28						
	62				●				-.29			●	
	64								●				
	66						●						
	67						●						
	71				●								
	73						●						
	74				●								
	105										.35		
	112				.24								
	118								●				
	126											.24	
	128						.28						
	136										●		
	149											.24	
	158										●		
	159				●							.34	
	160				●		●						
	164				.30								
	165										●		
	168						.57						
	171						●						
Reading	64					●							
	105												●
	123					.32							
	151					.44							

---continued---

TYPES OF FACTORS:

As predicted, five types of factors emerged from analysis of the SV clusters: a) subtest-specific factors, b) subtest factors which retained their subtest configurations but also added other variables from other subtests to become "expanded" factors, c) new cross-subtest factors, d) style factors which define what a student does and also does not do, and e) factors with only negative loads which define, in some way, what the cluster itself is not.

Subtest-specific factors and their correlates:

Table 11 shows the nine subtest-specific factors that were found for Information, Comprehension and Block Design, the only subtests for which analysis is yet complete. Three of the factors re-occurred, with similar loadings, in more than one cluster. One showed a reversed configuration, suggesting an interaction between Information and Picture Completion on factor Inf VIII; i.e., this negatively loaded Information factor becomes positively loaded in the Picture Completion cluster, and the size of the loadings is also reversed.

Table 11 also shows other subtest factors that are related significantly at the level of $r \geq .30$ ($P \leq .02$) to each of the subtest-specific factors.

Table 11. Subtest-specific Factors which remained intact across all clusters, and their correlates.

Table 11 Subtest-Specific Factors

Subtest	Specific Factor	Var#	Subtest N	Total N (all subtests)	Subtest Cluster Loading	Loadings on Cross-Subtest Cluster Factors: Cluster Names	Loadings	Titles of Variables	Correlated Factors (.30+ = .01)
Information	III	27	7	35	.85			Repeated items/directions/words/numbers	
		40	5	5	.44			"Around/somewhere there"	IN/XI .51; SM/V .36; VO/XI .30; BD/IV .36; SC/IV .34
		164	14	52	.50			Asked tester to: help/narrow alternatives	
	VII	42	8	62	-.56	X/BD(Factor VII)	-.70	(-)Ended with "...or something/stuff/things like that"	
		49	11	74	.66		.46	Said "don't know how/can't do it" but continued	CO/IV .34; VO/XI .34; DS/I -.30; PA/IV -.34
		111	13	25	.44		NS	"Can't/don't remember (how)"/"forgot/lost it"	
	VIII	140	19	20	-.81	IX/PC(Factor VI)	.39	(-)Was surprised on beginning items	IN/I .30; IN/IV .36; SM/I .34; AR/III .37; BD/IV .34
		148	5	7	-.36		.65	(-)"Not into"/"never liked/cared/did"	
	XI	41	18	24	.62			"Somewhere/about"	
		44	26	88	.39			Repeated items/directions/words in questioning tone	IN/III .51; BD/VI .33; SC/IV .43
		160	23	91	.76			Asked tester to: repeat directions/items/words	
Comprehension	I	67	11	16	.75	XIV/Residual Factors	.84	Referred to personal experience	
		73	7	41	.58		.59	Made personal comments (own body/condition)	IN/I .40; CO/VII .54; VO/I .55; VO/XI .30; OA/I .43; OA/II .43
		128	10	16	.72		.75	Added facts/ideas/alternatives/qualifications	
	III	27	5	35	.51			Repeated items/directions/words/numbers	
		30	13	68	.59			Smiled/laughed	IN/IX .39; CO/VI .34; SM/IV .38; DS/III .34
		42	18	62	-.45			(-)Ended with "...or something/stuff/things like that"	
		44	19	88	.50			Repeated items/directions/words in questioning tone	
	VIII	62	48	229	.56	XII/VO(Factor VII)	.53	Tester intervened	
		64	40	166	.70		.81	Student responded to intervention	SM/V .32; AR/I .39; VO/II .35; BD/II .30
		69	5	19	-.40		-.38	(-)Referred to family	
Block Design	II	26	10	50	.78			Verbalized steps/solved problems outloud	
		51	6	27	.54			Exclaimed	CO/VIII .30; PC/I -.39; OA/IV .32
		119	6	24	.61			Recalled from previous testing	
	V	130	9	63	-.31			(-)Corrected self; "double-take"	
		136	6	28	.39			Expressed mastery/ease	VO/IV .35; VO/XI .31; SC/I .35
		138	9	57	.77			Assembled in a perfunctory way/superficial guessing	

A complete analysis of the first factor in Table 11, INF III, is shown in Table 12, with titles of all the variables. It can be seen that INF III variables do not re-occur in its correlates, which include variables from Vocabulary, Sentence Completions and Block Designs.

Some factors appear to be artifacts from the scoring process. Note Factor INF XI. which accounts for only 4.3 percent of the cluster variance, yet has a correlation of .51 with INF III (which accounts for 12 percent of the variance). In the original breakdown of observed responses into separate elements for scoring, some discriminations were apparently so fine that pairs of parallel variables resulted. These two factors apparently contain three sets of such parallel variables. Only one of each pair would have been scored for a given student, so the pairs would be negatively correlated, but since the variables in each pair were interchangeable, the correlation between the two factors is high.

Table 12 also suggests a syndrome that would characterize a cooperative, but rather inarticulate, student who had confidence in visual-motor functions and a tendency to draw on in-group experience, combined with dependence on the tester to guide him or her in meeting "outside" standards. It can be predicted that this syndrome would be related to a well-established subculture were good work habits and manual skills are emphasized, but where colloquial language is used, and where there is little interest in academics.

Table 12 Hypothetical "Syndrome" of Correlated Factors

		Var#	Title	Factor Loading	Subtest N	% of Total N
SUBTEST-SPECIFIC FACTOR:	IN/III	27	Repeated items/directions/words/ numbers	.85	7	20%
		40	"Around/somewhere there"	.44	5	100%
		164	Asked tester to: help/narrow alternatives	.50	14	27%
Correlated Factors at .01 level of significance:	*IN/XI r = .51	41	"Somewhere/about"	.62	18	75%
		44	Repeated items/directions/words in questioning tone	.39	26	30%
		160	Asked tester to: repeat directions/ items/words	.76	23	25%
	**SM/V r = .36	5	Referred to "you"	-.34	20	15%
		45	Responded in questioning tone	-.43	7	6%
		47	"I guess"	-.63	9	13%
	VO/XI r = .30	47	"I guess"	.52	11	16%
		51	Exclaimed	.67	5	19%
		114	"Don't know how to/can't really explain/express"	.55	7	39%
	**BD/IV r = .36	149	Handled materials by self	-.91	7	70%
		159	Asked tester to: confirm answers	-.38	8	17%
	SC/IV r = .34	4	Referred to self as "i"	.77	6	100%

* Also specific to Information and very similar to IN/III, possibly this factor results from "either/or" scoring of very similar pairs of variables on the Information subtest (e.g. 40,41; 27,44; 160,164)

** SM/V and BD/IV variables are all negatively loaded within their own subtest clusters

Expanded Subtest Factors and new Cross-subtest Factors:

There were more factors that remained intact, but expanded to pick up variables from other subtests, than there were subtest-specific factors. They were also more complex because a) they incorporated new variables, and b) they too, had significant correlations with other factors to which none of their variables carried over. These expanded factors, which seem to reflect adaptation of one behavioral set to different types of subtests, and their correlates, which seem to show a syndrome of related behavioral patterns, will require an overall chart for the 12 subtests to show links among them. The same comments apply to the third type of factor, i.e., the new cross-subtest factor made up of re-combined variables. As yet, only Information, Comprehension and Block Design analyses for these kinds of factors have been finished.

The problem of variables which have combined more than one factor is relevant here. The first one to be studied was Variable #30 (Smiled, laughed). It occurred as a SV Similarities factor (SM IV/30) which was related significantly to factors from Reading (.44), Comprehension (.38), Digit Span (.36) and Information (.33). However, #30 itself occurred only in two of these, while it was found in unrelated Picture Completion and Vocabulary factors in four other clusters. A stable combination of Inf30/43 re-occurred three times, and the factor PC/45/49/30 re-occurred twice. In all, there seemed to be six "Smile" variables. A correlation matrix for these variables was as follows:

Table 13. Signficant Correlations for Variable #30

	IN	CO	SM	VO	DS	PC
IN		.42	.37	.35	.38	.23
CO			-.00	.44	.28	.00
SM				.00	.00	.00
VO					.00	.00
DS						.00
PC						

Analysis of the "Smile" cluster, made up of SM VI/30 and all other factors containing #30, produced 12 factors, only three of which loaded on #30. The largest, accounting for 13 percent of the variance, loaded on PC/30, BD/51 (Exclaimed) and CO/74 ("I guess"). A second factor loaded on SM/30 and DS/51, while a third included Inf/30, VO/30 and CO/30. Inf/30 and SM/30 also made small contributions to three other factors.

It was concluded that there were probably three "Smile" factors: a) one for subtests involving rather free recall (Information, Vocabulary, Comprehension), b) another for those involving more controlled associations (Similarities, Digit Span), and c) another, which joined with other variables, for Picture Completion and Block Design. Any syndromes which may be related to these remain to be explored.

Meanwhile, the analysis separated out five other factors which accounted for much of the cluster variance, and in which #30 did not figure at all. The cluster as a whole seemed to reflect attempts by students to focus on tasks (e.g., exclamations when tasks were presented, requests for repetition, corrective after-thoughts, second attempts, repetition of item information to self, and references to past experience with performance tasks). The results of the Smile cluster analysis are shown in Table 14.

Table 14. Analysis of the Smile/Laugh Cluster (Variable #30)

Factor	Subtest/ Var#	Factor Loading	Title	% of Cluster Variance
I	BD/119	.72	Recalled from previous testing	19.2
	OA/73	.64	Made personal comments/comments about own body/condition	
	OA/119	.62	Recalled from previous testing	
	CO/67	.56	Referred to personal experience (doing/working)	
	BD/136	.49	Expressed mastery/ease; congratulated/encouraged self; predicted success	
	BD/51	.45	Exclaimed ("What a day" "What!?" "Oh wow/boy/God/shoot/heck")	
II	BD/51	.68	Exclaimed ("What a day" "What!?" "Oh wow/boy/God/shoot/heck")	12.8
	PC/30	.66	Smiled/laughed; smiled/laughed on beginning items/when stuck	
	CO/47	.51	"I guess (right)/I'm going to take a guess/just guessing"	
	PC/49	.47	Said "don't know how/can't do it..." but continued; responded but also said "don't know/no/no idea/can't tell/forgot" (no ideas were added when questioned)	
	PC/45	.42	Responded in questioning tone	
	IN/45	.39	Responded in questioning tone; questioning tone on beginning items (IN)	
III	RD/64	.70	Student responded to intervention; tried more as chosen by tester/did more when urged/corrected errors when asked to check/try again (RD)	11.7
	CO/44	.53	Repeated items/directions/words in questioning tone	
	IN/45	.45	Responded in questioning tone; questioning tone on beginning items (IN)	
	OA/164	.45	Asked tester to: help/demonstrate/frame context/narrow alternatives/give information; "what is it supposed to be?" "piece missing" (OA)	
	SM/30	.35	Smiled/laughed; smiled/laughed on beginning items/when stuck	
	OA/119	.34	Recalled from previous testing	
IV	CO/30	.66	Smiled/laughed; smiled/laughed on beginning items/when stuck	10.2
	VO/30	.64	Smiled/laughed; smiled/laughed on beginning items/when stuck	
	IN/30	.56	Smiled/laughed; smiled/laughed on beginning items/when stuck	
	VO/159	.35	Asked tester to: confirm answers; "would you say/this what you mean/you want me to be more specific?"	
V	DS/51	.80	Exclaimed ("What a day" "What!?" "Oh wow/boy/God/shoot/heck")	8.9
	SM/30	.76	Smiled/laughed; smiled/laughed on beginning items/when stuck	
VI	PC/136	.81	Expressed mastery/ease; congratulated/encouraged self; predicted success	8.6
	VO/30	.45	Smiled/laughed; smiled/laughed on beginning items/when stuck	
	CO/44	-.36	Repeated items/directions/words in questioning tone	
	BD/119	-.35	Recalled from previous testing	
VII	PC/158	.91	Asked tester to: confirm instructions/directions	6.1
	BD/136	.38	Expressed mastery/ease; congratulated/encouraged self; predicted success	
	VO/159	.34	Asked tester to: confirm answers; "would you say/this what you mean/you want me to be more specific?"	
VIII	DS/30	.76	Smiled/laughed; smiled/laughed on beginning items/when stuck	5.5
	IN/30	.40	Smiled/laughed; smiled/laughed on beginning items/when stuck	
	VO/159	.36	Asked tester to: confirm answers; "would you say/this what you mean/you want me to be more specific?"	
IX	CO/160	.78	Asked tester to: repeat directions/items/words; "What?"	5.4
	AR/27	.45	Repeated items/directions/words/numbers; reflected elements aloud; repeated/reflected on beginning items	
	PA/118	-.36	Pushed material toward/to face tester when done; stacked cards/helped/turned pages/put pieces away spontaneously	
	IN/45	-.35	Responded in questioning tone; questioning tone on beginning items (IN)	
X	BD/130	.88	Corrected self; "double-take"	4.5
	CO/27	.34	Repeated items/directions/words/numbers; reflected elements aloud; repeated/reflected on beginning items	
XI	VO/160	.68	Asked tester to: repeat directions/items/words; "What?"	3.8
	DS/59	-.42	Rejected own response; said "did wrong/terrible" "I goofed up/messed up/blew it" "It ain't/not right"	
	OA/164	-.42	Asked tester to: help/demonstrate/frame context/narrow alternatives/give information; "what is it supposed to be?" "piece missing" (OA)	
XII	VO/51	.69	Exclaimed ("What a day" "What!?" "Oh wow/boy/God/shoot/heck")	3.2
	IN/30	.37	Smiled/laughed; smiled/laughed on beginning items/when stuck	

The Low# to High# Continuum:

The Low# and High# variable clusters produced a total of 16 Low# and 11 High# factors for the positively loaded subtest factor variables, and 9 Low# and 4 High# factors for the "Style" factor variables. Many of these were new cross-subtest factors. Factor scores for these factors were then pooled to make a single cluster for further analysis. The outcome showed no clear separation between the scores for Low# and High# factors. The factors that emerged are shown in Table 14.

A residual cluster, containing the variables from subtest factors that contained both Low# and High# variables together, also formed some new cross-subtest factors, along with some new Low# and some new High# factors and some combined Low#/High# factors. These too are shown in Table 14. The Continuum Hypothesis received no support from any of these analyses of Low# and High# variables. Nor did the distribution of significant positive correlations among the factor scores show any clustering of Low# and High# factors.

Table 14. Distribution of Factors obtained from Factor Scores for Low # and High # cross-subtest factors and from scores on variables in factors containing both Low # and High # Variables

		Factors with Low # Variables only	Factors with Hi#/Low# Variables Loading .40+	Factors with High # Variables only
Scores on Factors with only + loaded variables	Input	16	-	11
	Outcome	5	5	2
Scores on Style Factors with positively/ negatively loaded variables	Input	9	-	4
	Outcome	2	3	1
Scores on cluster of Residual Variables from Hi/Lo factors	Input	-	-	-
	Outcome	4	5	2

Correlation Analysis	Lo Lo		Lo/Hi		Hi Hi	
	pos	neg	pos	neg	pos	neg
Number of significant correlations-- Residuals	7	5	14	2	1	∅
Negative Factor Scores	2	1	2	2	1	∅
Positive Factor Scores	4	3	17	∅	2	3

Relationship of Low# and High# Factors to Background Variables:

No significant Chi Square relating any of the background factors to total scores for either the Low# or the High# positively loaded variables was found. However, the Low# Style factor score was significantly related, at the level of $P < .02$, to Ethnicity I* and at $P < .03$ to Ethnicity II; it also approached significance ($P < .08$) for the total High# score on Ethnicity I. This outcome does not lend support to the Continuum Hypothesis, but it does suggest that the personal interaction variables under study here will be related to differences in background culture when more adequate tests can be made.

DISCUSSION

Although this paper mainly describes steps being worked out, by inductive methods, as we convert a comprehensive set of raw observations to quantifiable factors, the outlines of some of the factors and response sets, or test-response syndromes, which are the goal of the project, can also be tentatively identified. Further, we are led to expect that within our population of students referred for problems, these sets will show adaptations to the achievement pressures inherent in test-taking that reflect learning in sub-cultures more than they reflect levels of cognitive or personality development. We found no support in this material for the developmental model as expressed in the continuum of "global to controlling" responses upon which the arrangement of variables in our scoring manual was based.

The failure of this hypothesis may be due to the narrow age range (13 to 16 years) of high school students tested on the WISC. As the entire analysis described herein will also be done for the WAIS, a maturation factor may emerge

*Ethnicity is "double-coded" to allow for bi-racial families.

at that time. It should be noted that the Low# WISC variables did tend to cluster on Verbal subtests, while High# variables were more often observed on Performance subtests; this grouping did not occur on the WAIS. Finally, we also found that Ethnicity seems more related to our grouping of Low# variables than other background factors.

Methodologically, we have discovered that some variables are too finely split, resulting in parallel factors, and others are too broad, actually encompassing more than one factor across subtests. It seems clear that social interaction variables must be considered in relation to the type of subtest, and that both subtest-specific and more general, cross-subtest, factors are involved. However, the more general factors appear to interact with type of subtest, probably in relation to content (e.g., objects versus people) and underlying mental processes (e.g., free association versus controlled association and manual performance, etc.). There remains, also, the question of widespread variables with N less than five on any subtest. As these may be a function of small sample size, they should not be dropped. Their distribution may indicate that some are split variables, as in the case of Information Factors III and XI. Others may simply be general factors that are broader than any identified so far.

As in all carefully done research, more interesting questions are opened up, and only a few are answered. Moreover, though the body of responses to be analyzed is large, it comes from a rather small sample of students, all selected because they were doing poorly in school. Thus, the data are thin; but it should also be noted that the sample is a representative one, demographically (see Appendix), perhpas accounting for the variety of responses we observe. In setting up the original scoring manual, experience dictated the fine breakdown of variables that was made. At that time, we questioned whether similar appearing types of behavior actually ment the same thing in all cases. A much larger sample will be needed to relate observed response factors and syndromes

appearing types of behavior actually meant the same thing in all cases. A much larger sample of cases will be needed to relate observed response factors and syndromes to students' "learning spaces", however.

There is still much work to be done on the checklist, itself. Two rather simple methods have been productive. These are: a) use of factor scores to find cross-subtest relationships, and b) use of correlation matrices to distinguish between cross-subtest factors and correlated factors which share no variables with their correlates. For scoring, the cross-subtest (and also subtest-specific) factors may be re-defined as variables. Variables like "Smiles", which contain more than one factor will, of course, be broken up and distributed.

For sets of correlated factors, the variables will be scored as syndromes, using a key for each one identified. Those brought out so far seem to be a) indicators that the student has a "loss-of-self" and relies on the tester to think for him or her, b) a set of ways in which the student manipulates his or her own attending responses in externalized ways, and c) a pattern where the student reflects confidence in problem-solving skills based in his or her own sub-culture, but relies on guidance for "proper" expression in school.

In conclusion, the work so far reinforces our belief in its practical importance. Our concern for improved understanding of students' test behavior rests on a well established principle of social psychology which indicates that aroused people tend to fall back on familiar responses, a tendency which increases as they become more aroused. Obviously, the most "familiar" responses will be those learned while problem-solving in the mini-culture of the student's "learning space." If a student is made nervous by the presence of a tester, or a teacher, error will result if the aroused response is an interfering one, and the student may then become a "false positive" case if the issue is learning disability.

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16. Oldest N. European boy with Technology (sex-type I) father 2 cases
18. Oldest N. European boy with Business/Government father
27. Oldest Hispanic boy with Technology (sex-type II) father
72. Middle N. European boy with Personal Service father
76. Middle N. European boy with Technology (sex-type I) father
77. Middle N. European boy with Technology (sex-type II) father
78. Middle N. European boy with Business/Government father
87. Middle Hispanic boy with Technology (sex-type II) father
89. Middle Hispanic boy with Outdoor father
110. Middle S. European boy with permanently Unemployed father
116. Middle Black boy with Technology (sex-type I) father
134. Youngest N. European boy with General Culture father
136. Youngest N. European boy with Technology (sex-type I) father
140. Youngest N. European boy with permanently Unemployed father
143. Youngest Hispanic boy with Business Contact father
147. Youngest Hispanic boy with Technology (sex-type II) father 2 cases
152. Youngest S. Asian boy with Personal Service father
163. Youngest S. European boy with Business Contact father
196. Oldest N. European girl with Technology (sex-type I) father
198. Oldest N. European girl with Business/Government father
232. Oldest Black girl with Personal Service father
266. Middle Hispanic girl with Technology (sex-type I) father
267. Middle Hispanic girl with Technology (sex-type II) father
296. Middle Black girl with Technology (sex-type I) father 3 cases
316. Youngest N. European girl with Technology (sex-type I) father

379. Youngest Black boy with no father
385 Oldest Black girl with no father
393. Youngest N. European girl with no father

399. Oldest N. European boy with father's occupation changing
403. Oldest Black boy with father's occupation changing (Single parent) 2 cases
405. Middle N. European boy with father's occupation changing
406. Middle Hispanic boy with father's occupation changing
411. Youngest N. European boy with father's occupation changing
415. Youngest Black boy with father's occupation changing (Single parent)
417. Oldest N. European girl with father's occupation changing
420. Oldest S. European girl with father's occupation changing
423. Middle N. European girl with father's occupation changing
429. Youngest N. European girl with father's occupation changing

435. Oldest bi-racial boy with Personal Service father (NOr/NEur)
444. Middle bi-racial boy with Personal Service father (NEur/Hisp)

Ord.: Oldest/middle N. European boy with Business/Government father
Mult: Middle bi-racial boy with father's occupation changing (NEur/Hisp)
Middle/oldest bi-racial girl with Technology (sex-type I) father (NEur/Hisp)

IDENTIFIED MGM STUDENTS

Class	WISC/ Binet	Other	Last Year GPA	Elem. School Identif.	Accel.	Ethnic	Cult. H'cap

WISC profiles for those students for whom there was more than one case Appendix

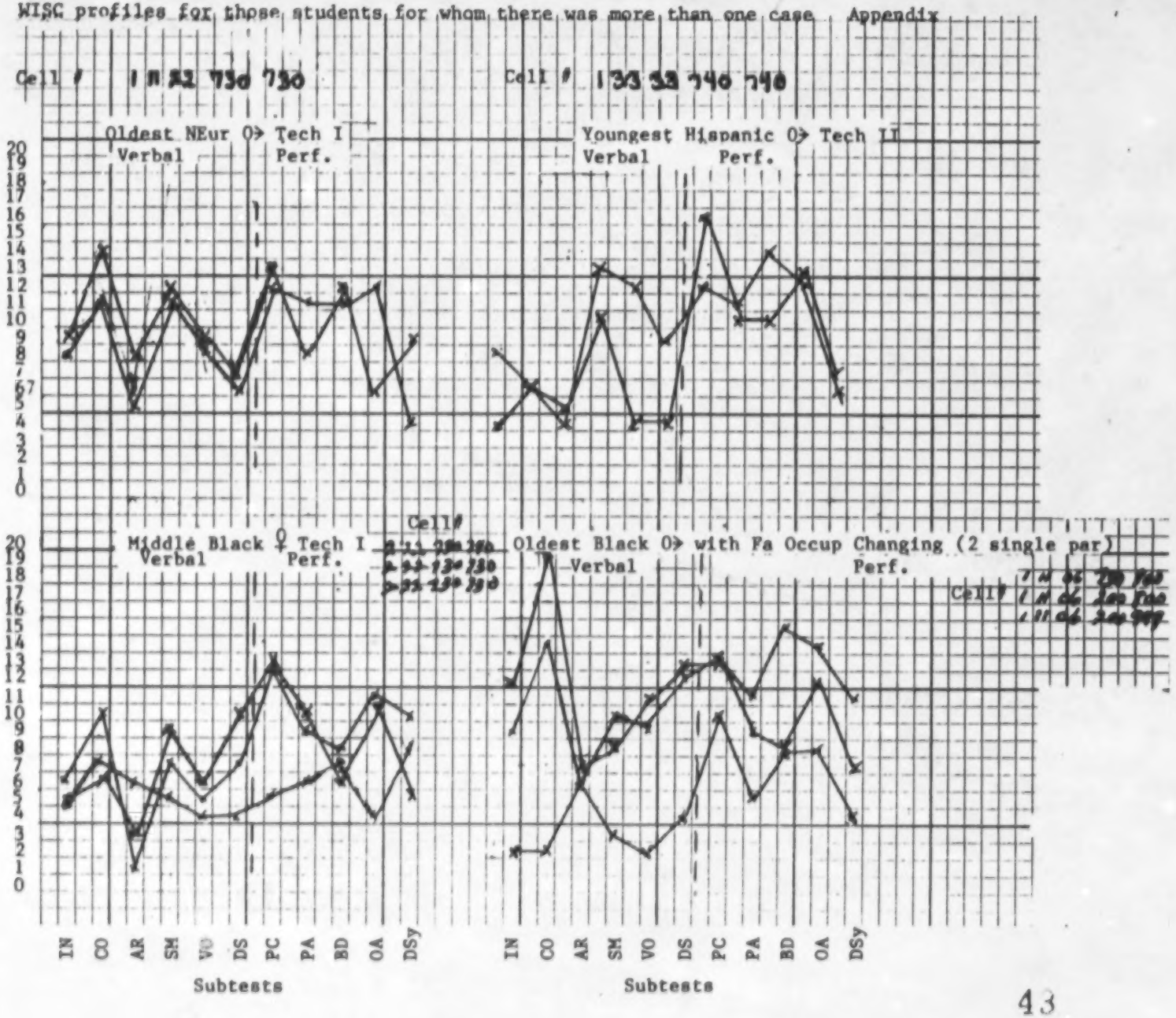

Figure 1. A model for classifying personal interactions in testing from p. 3

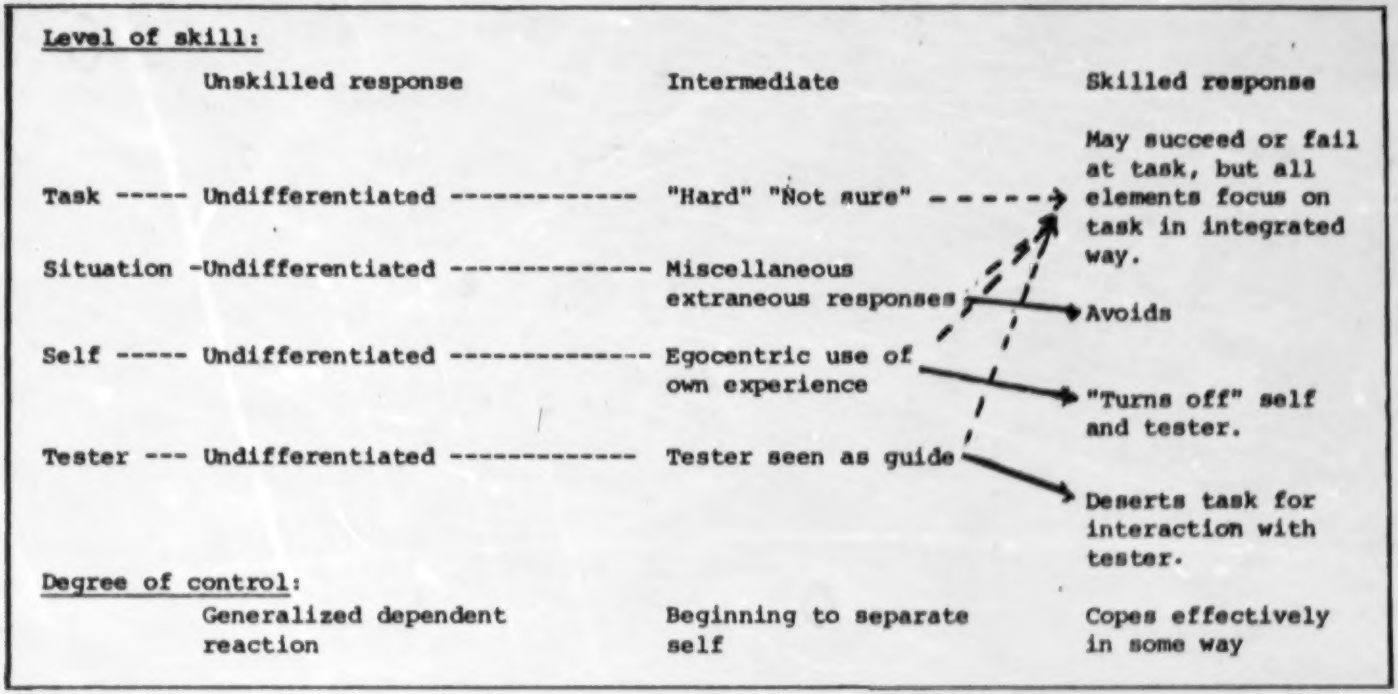
Level of skill:
Unskilled response
Intermediate
Skilled response
Task ----- Undifferentiated ----------
"Hard" "Not sure"
May succeed or fail at task, but all elements focus on task in integrated way.
Situation -Undifferentiated ----------
Miscellaneous extraneous responses
Avoids
Self ----- Undifferentiated ----------
Egocentric use of own experience
"Turns off" self and tester.
Tester --- Undifferentiated ----------
Tester seen as guide
Deserts task for interaction with tester.
Degree of control:
Generalized dependent reaction
Beginning to separate self
Copes effectively in some way

Figure 2. Gradient of Subtest N's

WISC Variables (N ≥ 5)

from p. 9

#	Title	CV																Ttl
4	Referred to self as "i"										6 SC							6
5	Referred to "you"					3 IN	20 SM	27 SC	43 CO	44 VO								137
6	Referred to "we/us/our"									13 SC								13
7	Referred to "him/her/he/she/his/hers"								4 VO	21 SC								25
8	Referred to "them/they/theirs/every-any-some-body/one/others"							2 VO	2 CO	38 SC								42
9	Echoed clichés: parents' assist, patriotic, religious									8 SC								8
13	Lets tester guide responses								2 RD	3 VO	1 PA							6
14	Performed from tester's standpoint									4 PA BD	2 OA	2 CD						12
15	Shook head "no"					2 DS	2 AR	3 SM	5 IN	10 CO VO	3 PC	1 BD						36
16	Used hands to point or gesture							2 IN	3 CO	5 VO	3 PC							13
17	Trailed off assuming "you" would have some thoughts & finish idea					2 CO	2 IN	6 SM	7 VO	10 SC	3 PC							30
19	Made hand or leg movement									1 CO SM AR DS CD								5
23	Did something to self without object (scratched)							1 DS	1 SM	2 VO	1 OA							5
24	Sighed						1 VO	1 AR	1 CO	4 BD	2 PA	1 OA						10
25	Yawned/stretched						1 AR	3 SM	4 CO	5 VO	2 OA	1 BD						16
26	Verbalized steps/solved problems outloud					1 SM	2 VO	4 AR	4 IN	16 OA	10 BD	7 PA	5 PC	1 CD				50
27	Repeated items/directions/words/numbers					4 CO	5 AR	7 VO	7 IN	12 SM								35
28	Used fillers ("um/uh/well/etc")								2 IN	11 VO	1 BD							14
29	Made noises to self (hummed/whispered)								1 AR	2 PC OA	1 PA							6
30	Smiled/laughed			1 RD	2 AR	5 VO	5 SM	8 DS	13 CO	20 IN	6 PC	3 PA	2 OA	2 BD	1 CD			68
31	Joked/playful testing of limits							1 CO	3 SM	7 IN	2 PC	1 PA	1 OA					15
33	Mumbled/negative noise/inarticulate response						1 SM	1 CO	2 RD	3 IN VO	2 BD	1 PC						13
34	Changed response/gave two answers				2 SM	3 DS	4 AR	4 CO	7 VO	13 IN	2 PC							35
36	"Maybe/perhaps"/"could/might be"								1 IN	2 CO VO								5
37	"Probably"/"sounds like/right"							1 VO	1 IN	4 CO	1 PC							7
38	Left unspecific/rounded off								3 IN	6 AR								9

Figure 3. Gradient of variable loading in Subtest Factors

from p. 9

Var#	Title	+CV								-CV				
62	Tester intervened			SC 1	VO 3	CO 8	BD 1	PA 1	OA 3		IN 1	SM 2		
				.34	.51	.56	.93	.84	.58		-.39	-.84		
				12	45	48	15	21	6		45	28		
63	Tester intervened on beginning items						IN 4					——		
							.30					——		
							8					——		
64	Student responded to intervention	RD 2	VO 8	SM 3	CO 8	IN 2	PA 1	BD 1				——		
		.21	.47	.57	.70	.79	.98	.84				——		
		20	41	17	40	17	9	14				——		
66	Referred to "I/me/my opinion/to me/for me"						SC 1					CO 6		
							.55					-.39		
							42					25		
67	Referred to personal experience						CO 1					——		
							.75					——		
							11					——		
69	Referred to family						VO 12					CO 8		
							.44					-.40		
							9					4		

Figure 4 Gradient of correlates of each Subtest Factor, by Subtest

from p. 10

	+C							-C			
Vocabulary	CO	DS	SM	AR	IN	CO	BD				
I	VII	III	I	III	I	I	III				
	.27	.31	.31	.33	.41	.55	.29				
	IN	IN	DS	IN	AR	CO	IN	BD	OA	PC	PC	PC	BD
II	VI	III	II	X	II	VIII	IX	III	III	III	V	II	II
	.24	.24	.26	.29	.34	.35	.43	.40	.37	.30	.27	.26	.25
				CO	IN	SC	DS	PC					
III				II	IV	I	II	IV					
				.31	.33	.36	.40	.26					
	SM	IN	DS	CO	SC	IN	BD						
IV	I	III	II	II	I	IV	V						
	.24	.29	.30	.30	.33	.35	.35						
				SM	IN	SM	PC	PC	PC	BD			
V				V	IX	III	II	III	V	IV			
				.27	.32	.34	.30	.30	.25	.24			
		SC	SC	IN	CO	AR	PC	OA	OA				
VI		I	II	X	II	I	V	V	IV				
		.23	.25	.25	.31	.41	.32	.27	.25				
	AR	SM	IN	CO	CO	IN	BD						
VII	III	II	VI	VIII	IV	V	IV						
	.24	.25	.26	.27	.28	.28	.46						
							OA						
VIII							III						
							.27						
		SM	AR	CO	DS	PC	PA	BD	PC				
IX		V	II	II	II	IV	II	III	II				
		.28	.35	.35	.40	.42	.25	.25	.24				
						CO	BD	PC					
X						V	IV	I					
						.51	.30	.26					
		AR	CO	CO	IN	IN	BD	OA					
XI		V	VIII	I	III	VII	V	IV					
		.23	.26	.30	.30	.34	.31	.23					
					SM	CO	BD						
XII					I	V	VI						
					.27	.53	.26						

	-C				
	SC	DS			
	III	II			
	-.23	-.29			
		—			
		—			
		—			
	CO	CO	OA		
	VII	VI	II		
	-.26	-.31	-.27		
		—			
		—			
		—			
CO	CO	PA	BD		
I	VII	II	I		
-.25	-.28	-.29	-.24		
		—			
		—			
		—			
		—			
		—			
		—			
AR	IN	SM	PC	BD	
III	III	V	II	IV	
-.27	-.27	-.42	-.40	-.30	
		—			
		—			
		—			
		—			
		—			
		—			
		FC			
		V			
		-.24			
		—			
		—			
		—			

from p. 13

Table 1 WISC: Distribution of variables with subtest N≥5, and number of factors obtained from analyses of subtest clusters

Subtest	IN	CO	SM	AR	VO	DS	PA	PC	OA	BD	CD	CC	RD	TOTAL
Number of variables in subtest cluster	29	19	13	12	30	7	9	15	11	14	ø	9	5	173
Number of factors obtained	11	7	5	5	12	3	4	6	5	7	ø	4	2	71
Number of Residual Variables*	1	2	1	ø	2	1	2	2	ø	4	ø	1	1	17

* 3 of these do not have significant loadings in any subtest

from p. 14

Table 2. Variables which occur with frequency ≥5 on a given subtest, but have no significant factor loadings within the subtest cluster

Subtest/Var#	Subtest N	Title
CO/5	43	Referred to "you"
SC/17	10*	Trailed off, assuming "you" would have some thoughts and finish idea
VO/28	11*	Used fillers ("um/uh/well/etc")
PC/43	6	Left open-ended ("whatever")
VO/75	16*	Excused self—lack of academic exposure
PA/126	11	Obviously hurried; used two hands rapidly
PC/138	14	Assembled in a perfunctory way/superficial guessing
DS/138	7	Assembled in a perfunctory way/superficial guessing
CO/142	8	Argued/disagreed with/suspicious of test/items
RD/158	9*	Asked tester to: confirm instructions/directions
BD/158	8	Asked tester to: confirm instructions/directions
BD/164	7	Asked tester to: help/narrow alternatives
BD/168	11*	Asked tester to: frame/structure the test/items

* Largest N of any subtest

Table 3. Residuals in no subtest factor

from p. 14

Variable #	Largest Subtest N	Total N	Title
28	VO/11	14	Used fillers ("um/uh/well/etc")
50	IN/7	13	"Not (quite) sure/don't know"
125	PA/6	14	Commented on being timed/time/own speed
163	SM/5	8	Asked tester to: define words
172	BD/5	17	Hinted at/resisted/challenged with questions

Table 5. Factor score correlations $\geq P = .001$

from p. 16

Within Subtests			Across Subtests							
Subtest	Factors	r		CO	AR	PA	OA	BD	SC	RD
IN	III/XI	.51	VO	.51 .53 .55				.46		
CO	I/VII	.54								
VO	II/V	.55	CO		.52				.66	
			SM		.59			.50		.44
			AR			.52				
			PC				.48			

from p. 15

Table 4. "Main" Subtest Variables having significant correlations with 47% or more of all variables on the same subtest (Numerals show the subtest factor into which the "main" variable fell)

Var #	Ttl N	Title	Subtest											
			IN	CO	SM	AR	VO	DS	PA	PC	OA	BD	SC	RD
7	25	Referred to "him/her/he/she/his/hers"											III	
8	42	"Them/they/theirs/every-any-some-body/ one"											II	
17	30	Trailed off assuming "you" would finish			III									
26	50	Verbalized steps/solved probs. outloud									II	II		
30	68	Smiled/laughed	IX	III										
42	62	Ended with "...or something/stuff/ things like that"					II							
44	88	Repeated items/directions/words in questioning tone	XI		I									
45	109	Responded in questioning tone	IX			II								
46	36	"I think/suppose/believe"	X											
47	67	"I guess"		II										
49	74	Said "don't know how/can't do it" but continued		VI	III									
61	30	Heard wrong information/continued incorrectly								I				
62	229	Tester intervened			II									
66	75	Referred to "I/me/my opinion/to me/ for me"		VI									I	
67	16	Referred to personal experience		I										
105	169	"Don't know...what it means"		IV		I				IV				I
111	25	"Can't/don't remember (how)"/"forgot/ lost it"	VII											
119	24	Recalled from previous testing									I			
121	15	Commented on/talked to materials as though alive									II			
127	15	Continued past time/checked work										VI		
130	63	Corrected self; "double-take"									V			
132	27	"At least will try"/"trying best"								I				
136	28	Expressed mastery/ease					IV					V		
140	20	Was surprised on beginning items	VIII											
149	10	Handled materials by self										IV		
159	46	Asked tester to: confirm answers										IV		
160	91	Asked tester to: repeat directions/ items/words	XI	II										
164	52	Asked tester to: help/narrow alternatives									I			

from p. 17

Table 6 Relation of Single-Variable (SV) Factors to their own correlated Factor Clusters and other SV Clusters

Subtest SV Factor	IN II	IN V	SM IV	AR V	VO VII	VO IX	DS II	PA III	PC VI	OA IV	BD VI	BD VII	SC IV
Single Variable #	64	75	30	27	16	44	45	26	142	171	127	126	4
Re-occurrence of SV Factor Variable in correlated subtest factors	PA	none	CO IN	none	none	AR	IN	OA	none	none	none	none	none
Number of variables in SV Cluster	22	5	14	23	16	21	43	18	13	23	26	14	33
Number of factors obtained from SV Cluster	9	2	5	9	6	8	15	8	6	9	9	5	11
SV Cluster Factor on which SV occurs with loading of $\geq .40$	II	II	I	IV	I	II	IX	I	II	I	VI	V	III
Loading of SV for that factor	.67	.48	.75	.47	.75	.43	.47	.78	.62	.72	.71	.70	.53
% of SV Cluster Variance explained by that factor	16%	36%	37%	12%	32%	19%	5%	30%	24%	19%	7%	8%	12%
Number of times any SV Cluster Variables re-occurred in other SV Clusters ($\geq .40$)	9	1	6	6	1	5	10	4	3	6	ø	4	1
% of cluster overlap	41%	20%	43%	26%	6%	24%	67%	22%	23%	26%	ø	29%	3%

from p. 18:

Table 7 Expansion of Single-Variable Subtest Factors within SV clusters: new Factor having the largest loading of Single Variable

Single Variable Factor from Subtest	Cluster	Variable	Loading	Title
IN/II	Var 64	IN/64	.67	Student responded to intervention
		SM/160	.42	Asked tester to: repeat directions/items/words
		PA/118	-.40	Pushed material toward/to face tester when done
IN/V	Var 75	IN/75	.48	Excused self--lack of academic exposure
		PC/142	.41	Argued/disagreed with/suspicious of test/items
		VO/16	-.40	Used hands to point or gesture
SM/IV	Var 30	SM/30	.75	Smiled/laughed
		DS/51	.79	Exclaimed
AR/V	Var 27	AR/27	.47	Repeated items/directions/words/numbers
		VO/114	.67	"Don't know how to/can't really explain/express"
		VO/47	.63	"I guess"
		VO/51	.43	Exclaimed
VO/VII	Var 16	VO/16	.75	Used hands to point or gesture
		AR/38	.67	Left unspecific/rounded off
		AR/126	.64	Obviously hurried; used two hands rapidly
VO/IX	Var 44	VO/44	.43	Repeated items/directions/words in questioning tone
		PC/158	.71	Asked tester to: confirm instructions/directions
		SM/45	.65	Responded in questioning tone
		DS/45	.53	Responded in questioning tone
DS/II	Var 45	DS/45	.47	Responded in questioning tone
		VO/44	.78	Repeated items/directions/words in questioning tone
		AR/45	.49	Responded in questioning tone
		PC/158	.47	Asked tester to: confirm instructions/directions
		PC/165	.42	Asked tester to: give answers/answer question of own
PA/III	Var 26	PA/26	.78	Verbalized steps/solved problems outloud
		PC/165	.72	Asked tester to: give answers/answer question of own
PC/VI	Var 142	PC/142	.62	Argued/disagreed with/suspicious of test/items
		SC/8	.76	"Them/they/theirs/every-any-some-body/one/others"
OA/IV	Var 171	OA/171	.72	Generally interactive
		VO/114	.74	"Don't know how to/can't really explain/express"
		VO/47	.42	"I guess"
BD/VI	Var 127	BD/127	.71	Continued past time/checked work
		IN/74	.52	Excused self--lack of experience
		VO/49	-.43	Said "don't know how/can't do it" but continued
BD/VII	Var 126	BD/126	.70	Obviously hurried; used two hands rapidly
		IN/111	-.42	"Can't/don't remember (how)"/"forgot/lost it"
SC/IV	Var 4	SC/4	.53	Referred to self as "I"
		IN/27	.71	Repeated items/directions/words/numbers
		IN/164	.61	Asked tester to: help/narrow alternatives
		BD/159	.54	Asked tester to: confirm answers
		CO/128	.42	Added facts/ideas/alternatives/qualifications

from p. 19

Table 8 Single-Variable Cluster X: BD VII/126 "Obviously hurried; used two hands rapidly"

Subtest Factor	Correlation with SV BD/126	Variable #	Subtest N	% of Total N	Factor Loading
SC/IV	.24	SC/4	6*	100%	.77
IN/I	.26	IN/71	5*	83%	.78
		IN/159	8*	17%	.75
		IN/34	13*	37%	.67
		IN/112	5*	56%	.51
		IN/31	7*	47%	.48
		IN/62	45	20%	-.39
SM/III	-.29	SM/64	17	10%	.57
		SM/49**	10	14%	.50
		SM/.7	6	20%	.33
IN/VII	-.22	IN/49**	11	15%	.66
		IN/42	8	13%	-.56
		IN/111	13*	52%	.44

* Largest N of any subtest
** Var. 49 occurs twice, but r SM 49/IN 49 is not significant

Table 9 Factors from SV Cluster X, BD/126 from p. 20

Table 9 cont. from p.20

		Positively Loaded Variables			Negatively Loaded Variables		
Factor #	% of Cluster Variance	Variable #	Loading	Title	Variable #	Loading	Title
I	38%	IN/159	.90	Asked tester to: confirm answers; "would you say/this what you mean/ you want me to be more specific?"	IN/62	-.40	Tester intervened; needed repetition/questioned/ questioned at least once in 5 items/had to be urged to guess (IN)
		IN/71	.63	Referred to having had/learned/ studied/read in class; learning/ reading source/"kids know"			
		IN/34	.49	Changed response (order)/gave two answers/contradicted self/made false starts			
		SM/49	.42	Said "don't know how/can't do it.." but continued; responded but also said "don't know/no/no idea/can't tell/forgot" (no ideas were added when questioned)			
II	24%	IN/112	.64	Indicated inability to recall something familiar			
		SC/4	.55	Referred to self as "i"			
		IN/34	.45	Changed response (order)/gave two answers/contradicted self/made false starts			
		IN/71	.44	Referred to having had/learned/ studied/read in class; learning/ reading source/"kids know"			
III	17%	SM/64	.69	Student responded to intervention; expanded/improved (SM)			
		SM/17	.51	Trailed off, assuming "you" would have some thoughts and finish idea			
		SM/49	.41	Said "don't know how/can't do it.." but continued; responded but also said "don't know/no/no idea/can't tell/forgot" (no ideas were added when questioned)			
IV	13%	IN/49	.46	Said "don't know how/can't do it.." but continued; responded but also said "don't know/no/no idea/can't tell/forgot" (no ideas were added when questioned)	IN/42	-.70	Ended with "...or some-thing/stuff/things like that"; "like/and...all that/what stuff...every-thing/so on"
V	8%	BD/126	.70	Obviously hurried; used two hands rapidly	IN/111	-.42	"Can't/don't remember (how)," "forgot/lost it"
Residual		IN/31 Factor I	.39	Joked/playful testing of limits; joked/playful testing on beginning items/when stuck	SM/17 Factor V	-.35	Trailed off, assuming "you" would have some thoughts and finish idea

Table 10. Correlation coefficients (.23+) for "Repeating Variables" which occur on more than one subtest

from p. 21

		VO	SC	RD	IN	SM	CO	DS	PA	OA	PC	BD	AR
Vocabulary	5					Ø		.32					
	15				Ø			Ø					
	16				Ø								
	17					Ø							
	25							Ø					
	26										Ø		
	27							Ø					
	30				Ø	Ø	.44	Ø		Ø	Ø		
	34							Ø					
	38												.43
	42							Ø					
	43				Ø								
	44						.24	.35					Ø
	45			Ø	Ø	.26		.32			.23		.36
	46				.25			Ø					
	47				Ø	Ø	Ø			.33			Ø
	49					Ø	Ø	Ø			.48	-.23	
	51							Ø		.33		Ø	Ø
	54											Ø	
	56											.26	
	62				Ø	Ø	Ø	.31					
	64				.24		Ø						
	69						Ø					Ø	
	73				Ø				Ø				
	74		Ø		Ø								
	75				Ø								
	105				Ø		Ø	.28			Ø		
	109							Ø					
	114									.44			.44
	118										Ø		
	126												.59
	136							Ø			Ø		
	142					Ø							
	149											.23	
	154												.34
	155				Ø			Ø					
	158							-.23			.31		
	159							Ø			Ø	Ø	
	160				Ø		Ø			Ø			Ø
	164						Ø	.30					
	165										.54		
	171								Ø				

Table 10 cont.

from p. 21

		VO	SC	RD	IN	SM	CO	DS	PA	OA	PC	BD	AR
Sentence Completion	4											ø	
	5					ø							
	6										ø		
	8										.36		
	27				.38								
	31				ø								
	34				.27								
	40				ø								
	41				.24								
	43				.34								
	44				ø								
	46				ø								
	47						.28						
	62				ø				-.29			ø	
	64								ø				
	66						ø						
	67						ø						
	71				ø								
	73						ø						
	74				ø								
	105										.35		
	112				.24								
	118								ø				
	126											.24	
	128						.28						
	136										ø		
	149											.24	
	158										ø		
	159				ø							.34	
	160				ø		ø						
	164				.30								
	165										ø		
	168						.57						
	171						ø						
Reading	64					ø							
	105												ø
	123					.32							
	151					.44							

---continued---

Table 11 Subtest-Specific Factors

from p. 23

Subtest	Specific Factor	Var#	Subtest N	Total N (all subtests)	Subtest Cluster Loading	Loadings on Cross-Subtest Cluster Factors: Cluster Names	Loadings	Titles of Variables	Correlated Factors (.30+ = .01)
Information	III	27	7	35	.85			Repeated items/directions/words/numbers	
		40	5	5	.44			"Around/somewhere there"	IN/XI .51; SM/V .36; VO/XI .30; BD/IV .36; SC/IV .34
		164	14	52	.50			Asked tester to: help/narrow alternatives	
	VII	42	8	62	-.56	X/BD(Factor VII)	-.70	-)Ended with "...or something/stuff/things like that"	
		49	11	74	.66		.46	Said "don't know how/can't do it" but continued	CO/IV .34; VO/XI .34; DS/I -.30; PA/IV -.34
		111	13	25	.44		NS	"Can't/don't remember (how)"/"forgot/lost it"	
	VIII	140	19	20	-.81	IX/PC(Factor VI)	.39	-)Was surprised on beginning items	
		148	5	7	-.36		.65	-)"Not into"/"never liked/cared/did"	IN/I .30; IN/IV .36; SM/I .34; AR/III .37; BD/IV .34
	XI	41	18	24	.62			"Somewhere/about"	
		44	26	88	.39			Repeated items/directions/words in questioning tone	IN/III .51; BD/VI .33; SC/IV .43
		160	23	91	.76			Asked tester to: repeat directions/items/words	
Comprehension	I	67	11	16	.75	XIV/Residual Factors	.84	Referred to personal experience	
		73	7	41	.58		.59	Made personal comments (own body/condition)	IN/I .40; CO/VII .54; VO/I .55; VO/XI .30; OA/I .43; OA/II .43
		128	10	16	.72		.75	Added facts/ideas/alternatives/qualifications	
	III	27	5	35	.51			Repeated items/directions/words/numbers	
		30	13	68	.59			Smiled/laughed	
		42	18	62	-.45			-)Ended with "...or something/stuff/things like that"	IN/IX .39; CO/VI .34; SM/IV .38; DS/III .34
		44	19	88	.50			Repeated items/directions/words in questioning tone	
	VIII	62	48	229	.56	XII/VO(Factor VII)	.53	Tester intervened	
		64	40	166	.70		.81	Student responded to intervention	SM/V .32; AR/I .39; VO/II .35; BD/II .30
		69	5	19	-.40		-.38	-)Referred to family	
Block Design	II	26	10	50	.78			Verbalized steps/solved problems outloud	
		51	6	27	.54			Exclaimed	CO/VIII .30; PC/I -.39; OA/IV .32
		119	6	24	.61			Recalled from previous testing	
	V	130	9	63	-.31			-)Corrected self; "double-take"	
		136	6	28	.39			Expressed mastery/ease	VO/IV .35; VO/XI .31; SC/I .35
		138	9	57	.77			Assembled in a perfunctory way/superficial guessing	

Table 11 cont.

from p. 23

Table 14 "Smiled/Laughed" Cluster Factors from p. 28

Factor	Subtest/ Var#	Factor Loading	Title	% of Cluster Variance
I	BD/119	.72	Recalled from previous testing	19.2
	OA/73	.64	Made personal comments/comments about own body/condition	
	OA/119	.62	Recalled from previous testing	
	CO/67	.56	Referred to personal experience (doing/working)	
	BD/136	.49	Expressed mastery/ease; congratulated/encouraged self; predicted success	
	BD/51	.45	Exclaimed ("What a day" "What!?" "Oh wow/boy/God/shoot/heck")	
II	BD/51	.68	Exclaimed ("What a day" "What!?" "Oh wow/boy/God/shoot/heck")	12.8
	PC/30	.66	Smiled/laughed; smiled/laughed on beginning items/when stuck	
	CO/47	.51	"I guess (right)/I'm going to take a guess/just guessing"	
	PC/49	.47	Said "don't know how/can't do it..." but continued; responded but also said "don't know/no/no idea/can't tell/forgot" (no ideas were added when questioned)	
	PC/45	.42	Responded in questioning tone	
	IN/45	.39	Responded in questioning tone; questioning tone on beginning items (IN)	
III	RD/64	.70	Student responded to intervention; tried more as chosen by tester/did more when urged/corrected errors when asked to check/try again (RD)	11.7
	CO/44	.53	Repeated items/directions/words in questioning tone	
	IN/45	.45	Responded in questioning tone; questioning tone on beginning items (IN)	
	OA/164	.45	Asked tester to: help/demonstrate/frame context/narrow alternatives/give information; "what is it supposed to be?" "piece missing" (OA)	
	SM/30	.35	Smiled/laughed; smiled/laughed on beginning items/when stuck	
	OA/119	.34	Recalled from previous testing	
IV	CO/30	.66	Smiled/laughed; smiled/laughed on beginning items/when stuck	10.2
	VO/30	.64	Smiled/laughed; smiled/laughed on beginning items/when stuck	
	IN/30	.56	Smiled/laughed; smiled/laughed on beginning items/when stuck	
	VO/159	.35	Asked tester to: confirm answers; "would you say/this what you mean/you want me to be more specific?"	
V	DS/51	.80	Exclaimed ("What a day" "What!?" "Oh wow/boy/God/shoot/heck")	8.9
	SM/30	.76	Smiled/laughed; smiled/laughed on beginning items/when stuck	

Table 14 cont. from p. 28

Factor	Subtest/ Var#	Factor Loading	Title	% of Cluster Variance
VI	PC/136	.81	Expressed mastery/ease; congratulated/encouraged self; predicted success	8.6
	VO/30	.45	Smiled/laughed; smiled/laughed on beginning items/when stuck	
	CO/44	-.36	Repeated items/directions/words in questioning tone	
	BD/119	-.35	Recalled from previous testing	
VII	PC/158	.91	Asked tester to: confirm instructions/directions	6.1
	BD/136	.38	Expressed mastery/ease; congratulated/encouraged self; predicted success	
	VO/159	.34	Asked tester to: confirm answers; "would you say/this what you mean/you want me to be more specific?"	
VIII	DS/30	.76	Smiled/laughed; smiled/laughed on beginning items/when stuck	5.5
	IN/30	.40	Smiled/laughed; smiled/laughed on beginning items/when stuck	
	VO/159	.36	Asked tester to: confirm answers; "would you say/this what you mean/you want me to be more specific?"	
IX	CO/160	.78	Asked tester to: repeat directions/items/words; "What?"	5.4
	AR/27	.45	Repeated items/directions/words/numbers; reflected elements aloud; repeated/reflected on beginning items	
	PA/118	-.36	Pushed material toward/to face tester when done; stacked cards/helped/turned pages/put pieces away spontaneously	
	IN/45	-.35	Responded in questioning tone; questioning tone on beginning items (IN)	
X	BD/130	.88	Corrected self; "double-take"	4.5
	CO/27	.34	Repeated items/directions/words/numbers; reflected elements aloud; repeated/reflected on beginning items	
XI	VO/160	.68	Asked tester to: repeat directions/items/words; "What?"	3.8
	DS/59	-.42	Rejected own response; said "did wrong/terrible" "I goofed up/messed up/blew it" "It ain't/not right"	
	OA/164	-.42	Asked tester to: help/demonstrate/frame context/narrow alternatives/give information; "what is it supposed to be?" "piece missing" (OA)	
XII	VO/51	.69	Exclaimed ("What a day" "What!?" "Oh wow/boy/God/shoot/heck")	3.2
	IN/30	.37	Smiled/laughed; smiled/laughed on beginning items/when stuck	

from p. 29

Table 15 Distribution of Factors obtained from Factor Scores for Low # and High # cross-subtest factors and from scores on variables in factors containing both Low # and High # Variables

	Factors with Low # Variables only	Factors with Hi#/Low# Variables Loading .40+	Factors with High # Variables only
Scores on Factors with only + loaded variables			
Input	16	-	11
Outcome	5	5	2
Scores on Style Factors with positively/ negatively loaded variables			
Input	9	-	4
Outcome	2	3	1
Scores on cluster of Residual Variables from Hi/Lo factors			
Input	-	-	-
Outcome	4	5	2

Correlation Analysis	Lo Lo		Lo/Hi		Hi Hi	
	pos	neg	pos	neg	pos	neg
Number of significant correlations-- Residuals	7	5	14	2	1	ø
Negative Factor Scores	2	1	2	2	1	ø
Positive Factor Scores	4	3	17	ø	2	3